National Institute of Environmental Health Sciences

A current global view of environmental and occupational cancers

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Abstract:

This review is focused on current information of avoidable environmental pollution and occupational exposure as causes of cancer. Approximately 2% to 8% of all cancers are thought to be due to occupation. In addition, occupational and environmental cancers have their own characteristics, e.g., specific chemicals and cancers, multiple factors, multiple causation and interaction, or latency period. Concerning carcinogens, asbestos/silica/wood dust, soot/polycyclic aromatic hydrocarbons [benzo(a) pyrene], heavy metals (arsenic, chromium, nickel), aromatic amines (4-aminobiphenyl, benzidine), organic solvents (benzene or vinyl chloride), radiation/radon, or indoor pollutants (formaldehyde, tobacco smoking) are mentioned with their specific cancers, e.g., lung, skin, and bladder cancers, mesothelioma or leukemia, and exposure routes, rubber or pigment manufacturing, textile, painting, insulation, mining, and so on. In addition, nanoparticles, electromagnetic waves, and climate changes are suspected as future carcinogenic sources. Moreover, the aspects of environmental and occupational cancers are quite different between developing and developed countries. The recent follow-up of occupational cancers in Nordic countries shows a good example for developed countries. On the other hand, newly industrializing countries face an increased burden of occupational and environmental cancers. Developing countries are particularly suffering from preventable cancers in mining, agriculture, or industries without proper implication of safety regulations. Therefore, industrialized countries are expected to educate and provide support for developing countries. In addition, citizens can encounter new environmental and occupational carcinogen nominators such as nanomaterials, electromagnetic wave, and climate exchanges. As their carcinogenicity or involvement in carcinogenesis is not clearly unknown, proper consideration for them should be taken into account. For these purposes, new technologies with a balance of environment and gene are required. Currently, various approaches with advanced technologiesgenomics, exposomics, etc.have accelerated development of new biomarkers for biological monitoring of occupational and environmental carcinogens. These advanced approaches are promising to improve quality of life and to prevent occupational and environmental cancers.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Temperature, Other Exposure, Unspecified Exposure

Air Pollution: Other Air Pollution

Air Pollution (other): VOCs

Extreme Weather Event: Drought, Flooding

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co–Harm (Adaption/Mitigation):

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact:

specification of health effect or disease related to climate change exposure

Cancer

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Mitigation

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified